

AMENDMENTS TO THE CLAIMS

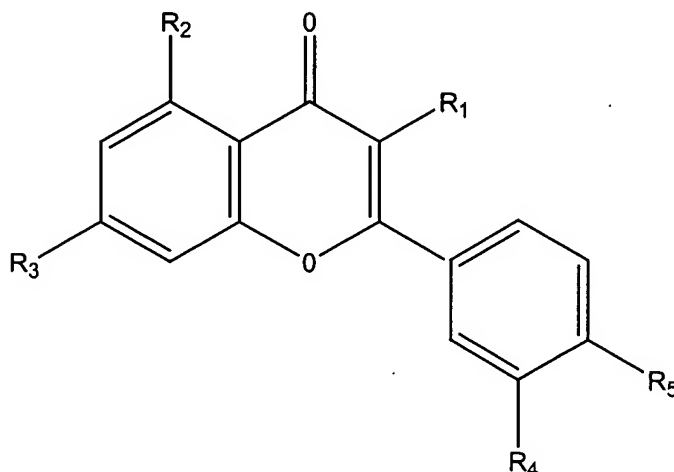
This listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

Claims 1-15 (Cancelled)

Claim 16 (New) A method of ameliorating the symptoms associated with osteoporosis, said method comprising:

administering to said subject a therapeutic agent comprising quercetin or at least one derivative thereof represented by the following general formula (I)



wherein

R₁ is gentiotriose, glucopyranose, O-arabinofuranose, O-diglucopyranose, O-galactopyranose, O-galactoside-gallate, O-gentiobiose, O-glucopyranose, O-glucuronide, O-neohesperidose, O-rhamnopyranose, O-sophorose, O-xylopyranose, OCH₃, OH, rhamnogentiobiose, rhamnoglucofucose, or sulfate;

R₂ is OH or O-glucopyranose;

R₃ is OCH₃, OH, O-glucopyranose, O-glucuronopyranose or glucopyranose;

R₄ is OCH₃, OH; and

R₅ is OCH₃, OH, O-glucopyranose or O-glucose, and

wherein said therapeutic agent lacks calcium.

Claim 17 (New) The method of Claim 16, wherein said quercetin or at least one derivative thereof is selected from the group consisting of quercetin, avicularoside, guiajaverin, hyperoside, isohyperoside, isoquercitrin, multinoside A, multinoside A acetate, quercitrin, quercetin-3-O-(2''-O- β -D-glucopyranosyl)- α -L-rhamnopyranoside, quercetin-3-O-(6''-O-galloyl)-glucopyranoside, quercetin-3-O-(6'''-O-p-coumaroyl- β -D-glucopyranosyl-(1-2)- α -L-rhamnopyranoside), quercetin-3-O-D-glucopyranosyl-(1-6)- β -D-glucopyranosyl-(1-4)- α -L-rhamnopyranoside, quercetin-3-O-[2''-O-6'''-O-p-(7'''-O- β -D-glucopyranosyl)coumaroyl- β -D-glucopyranosyl]- α -L-rhamnopyranoside, quercetin-3-O-[6'''-p-coumaroyl- β -D-glucopyranosyl- β -(1-4)-rhamnopyranoside], quercetin-3-O-[α -L-rhamnopyranosyl (1-2)- α -L-rhamnopyranosyl-(1-6)- β -D-glucopyranoside], quercetin-3-O-[α -rhamnopyranosyl (1-4) α -L-rhamnopyranosyl (1-6) β -D-galactopyranoside], quercetin-3-O-[α -rhamnopyranosyl-(1-2)]-[β -glucopyranosyl-(1-6)]- β -D-galactopyranoside, quercetin-3-O-[α -rhamnopyranosyl-(1-4)- α -rhamnopyranosyl-(1-6)- β -galactopyranoside], quercetin-3-O- α -L-rhamnopyranosyl-(1-2)- β -D-galactopyranoside, quercetin-3-O- β -D-diglucopyranoside, quercetin-3-O- β -D-galactoside-2''-gallate, quercetin-3-O- β -D-glucopyranoside-(1-6)- β -D-galactopyranoside, quercetin-3-O- β -D-glucopyranosyl-(1-3)- α -L-rhamnopyranosyl-(1-6)- β -D-galactopyranoside, quercetin-3-O- β -D-glucuronide, quercetin-3-O- β -D-xylopyranoside, quercetin-3-O-diglucospyranoside, quercetin-3-O-gentiobioside, quercetin-3-O-glucopyranosylgalactopyranoside, quercetin-3-O-neohesperidoside, quercetin-3-gentiotrioside, quercetin-3-methyl ether, quercetin-3-rhamnogentiobioside, quercetin-3-rhamnoglucoside and quercetin-3-sulfate.

Claim 18 (New) The method of Claim 16, wherein said at least one quercetin derivative is selected from the group consisting of isorhamnetin, quercimeritrin, rhamnetin, quercetin-5-O- β -D-glucopyranoside, quercetin-7-O- β -D-glucuronopyranoside and spireaoside.

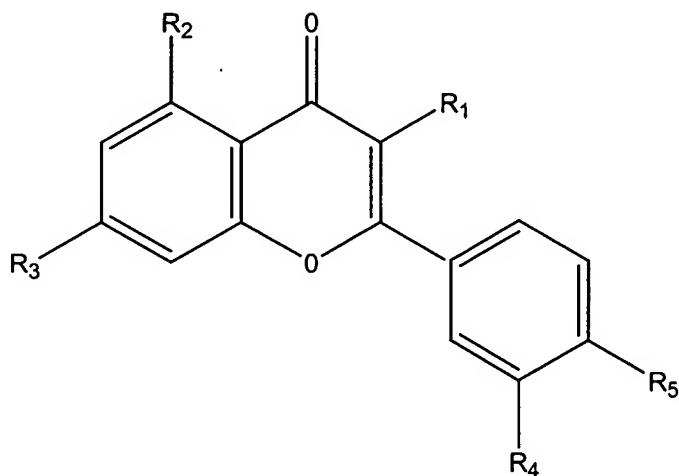
Claim 19 (New) The method of Claim 16, wherein said at least one quercetin derivative is selected from the group consisting of rhamnazin, quercetin-3',4'-di-methyl ether, quercetin-3,3'-dimethyl ether, quercetin-3,7-dimethyl ether, quercetin-3-O-[2''-O-(6'''-O-p-coumaroyl)- β -D-glucopyranosyl]- α -L-rhamnopyranosyl-7-O- β -D-glucopyranoside, quercetin-3-O-[2''-O-6'''-O-p-(7'''-O- β -D-glucopyranosyl)coumaroyl- β -D-glucopyranosyl]- α -L-rhamnopyranoside-7-O- β -D-glucopyranoside, quercetin-3-O-rutinoside-7-O- β -D-glucopyranoside, quercetin-3-O- α -L-arabinopyranosyl-7-O- β -D-glucopyranoside, quercetin-7-O- β -D-glucopyranoside-3-O-sophoroside, quercetin-3-O-galactopyranosyl-7-O-diglucopyranoside,

quercetin-3-O-glucopyranosyl-7-diglucopyranoside, quercetin-3,7-diglucopyranoside, quercetin-3-gentiobiosyl-7-glucopyranoside and quercetin-3,4'-di-O- β -D-glucopyranoside.

Claim 20 (New) The method of Claim 16, wherein said at least one quercetin derivative is selected from the group consisting of quercetin-3,4',7-trimethyl ether and quercetin-3,3',4',7-tetramethyl ether.

Claim 21 (New) A method of ameliorating the symptoms associated with osteoporosis, said method comprising:

administering to said subject a therapeutic agent consisting essentially of quercetin or at least one derivative thereof represented by the following general formula (I)



wherein

R₁ is gentiotriose, glucopyranose, O-arabinofuranose, O-diglucopyranose, O-galactopyranose, O-galactoside-gallate, O-gentiobiose, O-glucopyranose, O-glucuronide, O-neohesperidose, O-rhamnopyranose, O-sophorose, O-xylopyranose, OCH₃, OH, rhamnogentiobiose, rhamnoglucofucose, or sulfate;

R₂ is OH or O-glucopyranose;

R₃ is OCH₃, OH, O-glucopyranose, O-glucuronopyranose or glucopyranose;

R₄ is OCH₃, OH; and

R₅ is OCH₃, OH, O-glucopyranose or O-glucose.

Claim 22 (New) The method of Claim 21, wherein said quercetin or at least one derivative thereof is selected from the group consisting of quercetin, avicularoside, guaijaverin, hyperoside, isohyperoside, isoquercitrin, multinoside A, multinoside A acetate, quercitrin, quercetin-3-O-(2''-O-β-D-glucopyranosyl)-α-L-rhamnopyranoside, quercetin-3-O-(6''-O-galloyl)-glucopyranoside, quercetin-3-O-(6'''-O-p-coumaroyl-β-D-glucopyranosyl-(1-2)-α-L-rhamnopyranoside), quercetin-3-O-D-glucopyranosyl-(1-6)-β-D-glucopyranosyl-(1-4)-α-L-rhamnopyranoside, quercetin-3-O-[2''-O-6'''-O-p-(7'''-O-β-D-glucopyranosyl)coumaroyl-β-D-glucopyranosyl]-α-L-rhamnopyranoside, quercetin-3-O-[6'''-p-coumaroyl-β-D-glucopyranosyl-β-(1-4)-rhamnopyranoside], quercetin-3-O-[α-L-rhamnopyranosyl (1-2)-α-L-rhamnopyranosyl-(1-6)-β-D-glucopyranoside], quercetin-3-O-[α-rhamnopyranosyl (1-4)α-L-rhamnopyranosyl (1-6)β-D-galactopyranoside], quercetin-3-O-[α-rhamnopyranosyl-(1-2)]-[β-glucopyranosyl-(1-6)]-β-D-galactopyranoside, quercetin-3-O-[α-rhamnopyranosyl-(1-4)-α-rhamnopyranosyl-(1-6)-β-galactopyranoside], quercetin-3-O-α-L-rhamnopyranosyl-(1-2)-β-D-galactopyranoside, quercetin-3-O-β-D-diglucopyranoside, quercetin-3-O-β-D-galactoside-2''-gallate, quercetin-3-O-β-D-glucopyranoside-(1-6)-β-D-galactopyranoside, quercetin-3-O-β-D-glucopyranosyl-(1-3)-α-L-rhamnopyranosyl-(1-6)-β-D-galactopyranoside, quercetin-3-O-β-D-glucuronide, quercetin-3-O-β-D-xylopyranoside, quercetin-3-O-diglucospyranoside, quercetin-3-O-gentiobioside, quercetin-3-O-glucopyranosylgalactopyranoside, quercetin-3-O-neohesperidoside, quercetin-3-gentiotrioside, quercetin-3-methyl ether, quercetin-3-rhamnogentiobioside, quercetin-3-rhamnoglucoside and quercetin-3-sulfate.

Claim 23 (New) The method of Claim 21, wherein said at least one quercetin derivative is selected from the group consisting of isorhamnetin, quercimeritrin, rhamnetin, quercetin-5-O-β-D-glucopyranoside, quercetin-7-O-β-D-glucuronopyranoside and spireaoside.

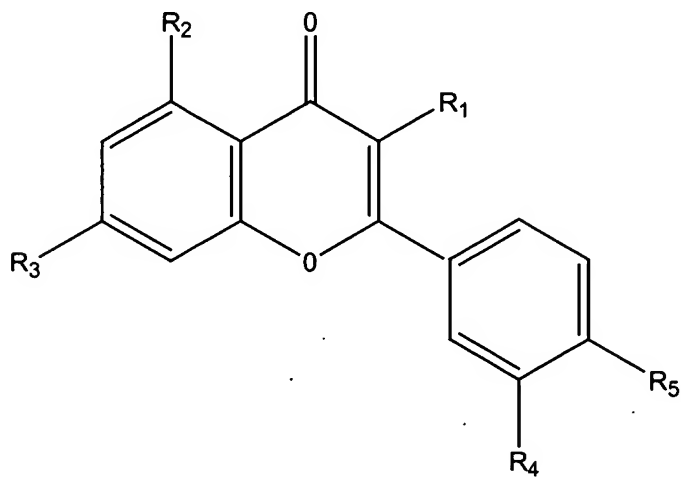
Claim 24 (New) The method of Claim 21, wherein said at least one quercetin derivative is selected from the group consisting of rhamnazin, quercetin-3',4'-di-methyl ether, quercetin-3,3'-dimethyl ether, quercetin-3,7-dimethyl ether, quercetin-3-O-[2''-O-(6'''-O-p-coumaroyl)-β-D-glucopyranosyl]-α-L-rhamnopyranosyl-7-O-β-D-glucopyranoside, quercetin-3-O-[2''-O-6'''-O-p-(7'''-O-β-D-glucopyranosyl)coumaroyl-β-D-glucopyranosyl]-α-L-rhamnopyranoside-7-O-β-D-glucopyranoside, quercetin-3-O-rutinoside-7-O-β-D-glucopyranoside, quercetin-3-O-α-L-arabinopyranosyl-7-O-β-D-glucopyranoside, quercetin-7-O-β-D-glucopyranoside-3-O-sophoroside, quercetin-3-O-galactopyranosyl-7-O-diglucopyranoside,

quercetin-3-O-glucopyranosyl-7-diglucopyranoside, quercetin-3,7-diglucopyranoside, quercetin-3-gentiobiosyl-7-glucopyranoside and quercetin-3,4'-di-O- β -D-glucopyranoside.

Claim 25 (New) The method of Claim 21, wherein said at least one quercetin derivative is selected from the group consisting of quercetin-3,4',7-trimethyl ether and quercetin-3,3',4',7-tetramethyl ether.

Claim 26 (New) A method of ameliorating the symptoms associated with osteoporosis, said method comprising:

increasing the trabecular bone area of a subject by administering to said subject a therapeutic agent, which comprises quercetin or at least one derivative thereof represented by the following general formula (I)



wherein

R₁ is gentiotriose, glucopyranose, O-arabinofuranose, O-diglucopyranose, O-galactopyranose, O-galactoside-gallate, O-gentiobiose, O-glucopyranose, O-glucuronide, O-neohesperidose, O-rhamnopyranose, O-sophorose, O-xylopyranose, OCH₃, OH, rhamnogentiobiose, rhamnoglucose, or sulfate;

R₂ is OH or O-glucopyranose;

R₃ is OCH₃, OH, O-glucopyranose, O-glucuronopyranose or glucopyranose;

R₄ is OCH₃, OH; and

R₅ is OCH₃, OH, O-glucopyranose or O-glucose, and

wherein said increase in trabecular bone area is at least about 29 percent.

Claim 27 (New) The method of Claim 26, wherein said quercetin or at least one derivative thereof is selected from the group consisting of quercetin, avicularoside, guaijaverin, hyperoside, isohyperoside, isoquercitrin, multinoside A, multinoside A acetate, quercitrin, quercetin-3-O-(2''-O-β-D-glucopyranosyl)-α-L-rhamnopyranoside, quercetin-3-O-(6''-O-galloyl)-glucopyranoside, quercetin-3-O-(6'''-O-p-coumaroyl-β-D-glucopyranosyl-(1-2)-α-L-rhamnopyranoside), quercetin-3-O-D-glucopyranosyl-(1-6)-β-D-glucopyranosyl-(1-4)-α-L-rhamnopyranoside, quercetin-3-O-[2''-O-6'''-O-p-(7'''-O-β-D-glucopyranosyl)coumaroyl-β-D-glucopyranosyl]-α-L-rhamnopyranoside, quercetin-3-O-[6'''-p-coumaroyl-β-D-glucopyranosyl-β-(1-4)-rhamnopyranoside], quercetin-3-O-[α-L-rhamnopyranosyl (1-2)-α-L-rhamnopyranosyl-(1-6)-β-D-glucopyranoside], quercetin-3-O-[α-rhamnopyranosyl (1-4)α-L-rhamnopyranosyl (1-6)β-D-galactopyranoside], quercetin-3-O-[α-rhamnopyranosyl-(1-2)]-[β-glucopyranosyl-(1-6)]-β-D-galactopyranoside, quercetin-3-O-[α-rhamnopyranosyl-(1-4)-α-rhamnopyranosyl-(1-6)-β-galactopyranoside], quercetin-3-O-α-L-rhamnopyranosyl-(1-2)-β-D-galactopyranoside, quercetin-3-O-β-D-diglucopyranoside, quercetin-3-O-β-D-galactoside-2''-gallate, quercetin-3-O-β-D-glucopyranoside-(1-6)-β-D-galactopyranoside, quercetin-3-O-β-D-glucopyranosyl-(1-3)-α-L-rhamnopyranosyl-(1-6)-β-D-galactopyranoside, quercetin-3-O-β-D-glucuronide, quercetin-3-O-β-D-xylopyranoside, quercetin-3-O-diglucospyranoside, quercetin-3-O-gentiobioside, quercetin-3-O-glucopyranosylgalactopyranoside, quercetin-3-O-neohesperidoside, quercetin-3-gentiotrioside, quercetin-3-methyl ether, quercetin-3-rhamnogentiobioside, quercetin-3-rhamnoglucoside and quercetin-3-sulfate.

Claim 28 (New) The method of Claim 26, wherein said at least one quercetin derivative is selected from the group consisting of isorhamnetin, quercimeritrin, rhamnetin, quercetin-5-O-β-D-glucopyranoside, quercetin-7-O-β-D-glucuronopyranoside and spireaoside.

Claim 29 (New) The method of Claim 26, wherein said at least one quercetin derivative is selected from the group consisting of rhamnazin, quercetin-3',4'-di-methyl ether, quercetin-3,3'-dimethyl ether, quercetin-3,7-dimethyl ether, quercetin-3-O-[2''-O-(6'''-O-p-coumaroyl)-β-D-glucopyranosyl]-α-L-rhamnopyranosyl-7-O-β-D-glucopyranoside, quercetin-3-O-[2''-O-6'''-O-p-(7'''-O-β-D-glucopyranosyl)coumaroyl-β-D-glucopyranosyl]-α-L-rhamnopyranoside-7-O-β-D-glucopyranoside, quercetin-3-O-rutinoside-7-O-β-D-glucopyranoside, quercetin-3-O-α-L-arabinopyranosyl-7-O-β-D-glucopyranoside, quercetin-7-O-β-D-glucopyranoside-3-O-sophoroside, quercetin-3-O-galactopyranosyl-7-O-diglucopyranoside,

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quercetin-3-O-glucopyranosyl-7-diglucopyranoside, quercetin-3,7-diglucopyranoside, quercetin-3-gentiobiosyl-7-glucopyranoside and quercetin-3,4'-di-O- β -D-glucopyranoside.

Claim 30 (New) The method of Claim 26, wherein said at least one quercetin derivative is selected from the group consisting of quercetin-3,4',7-trimethyl ether and quercetin-3,3',4',7-tetramethyl ether.